

CLAIMS

1. A complex porous structure of reticulated foam, felt or fabric type electroplated with metal throughout its entire developed surface, characterized in that the pre-metallization by depositing a conductive polymer comprises the following steps :

- (1) oxidizing pre-treatment of the base structure,
- (2) rinsing, possibly followed by draining and drying,
- (3) deposit in a wet phase, on the surface of the fibers or openings of the structure, of a monomer which in a polymerized form is electrically conductive,
- (4) possible natural draining or forced draining,
- (5) polymerization by oxidation-doping of the monomer into an electrically conductive polymer,
- (6) rinsing, and possible draining,
- (7) possible drying

wherein these steps are carried out within the structure, throughout its entire thickness, over the surface of each of its fibers or openings, without clogging its pores, and steps (3) to (7) may be repeated in the same order several times.

2. Structure according to claim 1, characterized in that the oxidizing pre-treatment step is carried out by means of a solution of potassium permanganate.

3. Structure according to claim 2, characterized in that the oxidizing pre-treatment step is carried out by immersion in a solution of potassium permanganate.

4. Structure according to claim 1, characterized in that the monomer deposited is pyrrole, furane, thiophene or certain derivatives thereof, notably functional monomers.

5. Structure according to claim 4, characterized in that the monomer deposited is pyrrole, and the corresponding conductive polymer formed by oxidation of the pyrrole is polypyrrole.

6. Structure according to claim 4, characterized in that the pyrrole is dissolved in an alcohol, notably isopropanol.

7. Structure according to claims 5 and 6, characterized in that the pyrrole solution used to carry out deposition of the monomer onto the

developed surface of said structure is an aqueous solution containing at least 50% by volume water, and in which the solvent for the pyrrole is isopropanol.

5        8.        Structure according to claims 5 and 6, characterized in that the monomer is precipitated by immersing the structure in an aqueous solution containing at least 50 % water by volume, and in which the solvent of the pyrrole is isopropanol.

10      9.        A metallized structure obtained by electroplating the structure according to one of the preceding claims, characterized in that the electroplating is carried out in an electrolysis bath containing ions which stabilize or oxidize the anodic structure.

15      10.      Structure according to claim 9, characterized in that the electroplating is carried out under pulsed current with current reversal, at least during the initial phase of electrolysis, until formation of a metallic deposit whose conductivity is at least equal to that of the conductive polymer structure.

20      11.      Structure according to claim 9 or 10, characterized in that the electroplating is carried out during an initial electrolysis phase, until constitution of a metallic deposit of conductivity at least equal to that of the conductive polymer structure, at a low current density.

25      12.      Structure according to any one of claims 9 to 11, characterized in that metal plated after the pre-metallization by deposit of the conductive polymer, is constituted of copper, nickel, iron, chromium, zinc, aluminum, tin, lead, gold, platinum or any other platinum family metal, or an alloy mixture or superposition of at least two of said metals.

30      13.      A method of producing metallic or metallized complex porous structures, characterized in it comprises the steps of pre-metallizing by a conductive polymer and electroplating metal onto organic or mineral foams, felts or fabrics, possibly followed by pyrolysis of the original materials and pre-metallization materials and a thermal treatment under controlled atmosphere of the metallic deposit or deposits, and in that the pre-metallization itself comprises steps :

- (1) oxidizing pre-treatment of the base structure,
- (2) rinsing, possibly followed by draining and drying,

- (3) deposit in a wet phase, on the surface of the fibers or openings of the structure, of a monomer which in a polymerized form is electrically conductive,
- (4) possible natural draining or forced draining,
- 5       (5) polymerization by oxidation-doping of the monomer into an electrically conductive polymer,
- (6) rinsing, and possible draining,
- (7) possible drying
- wherein these steps are carried out within the structure,
- 10   throughout its entire thickness, over the surface of each of its fibers or openings, without clogging its pores, and steps (3) to (7) may be repeated in the same order several times.